



รหัสวิชา 30901-2007 ชื่อวิชา เทคโนโลยีการจัดการฐานข้อมูล

Database Management Technology



agenda

Technology used in
database management

Data storage format

Storage Engine

View

Routine

Transaction

Replication

Repair

Using modern databases

Technology used in database management



A close-up photograph of a person's hands gently holding a small, upright plant with green leaves and clusters of tiny yellow flowers. The person is wearing a brown and gold patterned garment. The image is partially obscured by a white circular graphic element on the left side of the slide.

Introduction

-Definition of database management: The process of storing, organizing, and managing data in a structured way to ensure efficient data storage, retrieval, and maintenance.

-Importance of effective database management: Enables organizations to make data-driven decisions, improve operational efficiency, and maintain data integrity.

Relational Database Management Systems (RDBMS)

- Overview of RDBMS: Relational databases store data in tables with rows and columns, using SQL as the standard language for data manipulation.
- Popular RDBMS: MySQL, PostgreSQL, Oracle, SQL Server
- Key features: ACID compliance, scalability, transaction management, and robust security features.

NoSQL Databases

- Introduction to NoSQL databases: Designed to handle large amounts of unstructured data, with flexible schema and high scalability.
- Examples: MongoDB (document-oriented), Cassandra (column-family), Redis (key-value), Couchbase (document-oriented)
- Use cases: Big data, real-time web applications, IoT, and mobile apps.

Database Normalization

- Explanation of database normalization: The process of organizing data in a database to reduce redundancy and improve data integrity.
- Benefits of normalization: Reduce data anomalies, improve query performance, and simplify data maintenance.

Database Indexing

- Purpose of indexing: Improve the speed of data retrieval by creating a data structure that allows for efficient searching.
- Types of indexes: B-Tree, Hash, Spatial
- Choosing the right index: Consider the query patterns, data distribution, and storage

Database Backup and Recovery

- Importance of backup and recovery: Ensures data can be restored in the event of data loss, system failures, or other disasters.
- Backup techniques: Full, Incremental, Differential



Database Security

- Access control and user management: Implement robust user authentication and authorization mechanisms.
- Encryption and data protection: Secure data at rest and in transit using encryption techniques.
- Monitoring and auditing: Continuously monitor and audit database activities to detect and





thank you



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